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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/973,285
Filing Date: October 09, 2001
Appellant(s): SHAO, CHIA MU

Michael S. Gzybowski
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed January 14, 2008 appealing from the Office action mailed June 5, 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will affect or be directly by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is partially correct. Claims 1-11, 14 and 15 are pending in this application. Claims 1-11, 14 and 15 stand under Final Rejection, from which rejection of claims 1-11, 14 and 15 the appeal is taken. Claims 12 and 13 were canceled during the prosecution, not claims 12 and 3 as stated by Appellant. The statement made by Appellant that claims 12 and 3 were cancelled during the prosecution appears to be a typographical error. There are no other claims in this application.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows: **NEW GROUND(S) OF REJECTION**

for claims 1-11, 14 and 15. The rejection of independent claims 1,14 and 15 has been modified from a 103(a) as being unpatentable over Fuscone et al. to a 103(a) in view of what is obvious to one of ordinary skill in the art as being unpatentable over Fuscone et al. in view of Gordon et al. (US 5,419,565). Although it is believed Fuscone et al. in view of what is obvious to one of ordinary skill in the art provides a teaching of coreless inductance coils, nevertheless the rejection has been modified to better address appellant's remarks.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

GB 2,086,243A	Fuscone et al.	05/08/1982
US 5,419,565	Gordon et al.	05/30/1995
US 4,768,789	Clark	09/06/1988

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-6,8-11,14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuscone (GB 2,068,243A).

Regarding claim 1, Fuscone discloses an electric dart game comprising a dart (Fig. 1), a dartboard provided with a frame of a plurality of scoring areas by a plurality of radial spiders and circumferential spiders which are arranged crossly (Fig. 2,7 and 9), with a main body for receiving said dart and attached to said frame, and an electronic

scoring means for displaying signals collected from the scoring areas (Fig. 5). Said scoring system uses a plurality of inductance coils (Fig. 2 and page 1, lines 125-129 connected to the electronic scoring system (Fig. 5). Fuscone also discloses said dart is made of, thus provided with, a magnetic substance (page 1, lines 75-78, 103). Each of said coils is associated with a corresponding scoring area and thus defines a scoring signal zone (Fig. 2). When said dart is thrown at said dartboard, a scoring signal is generated by said dart entering said signal zone and is transmitted to said scoring system (page 2, lines 20-24, 66-82).

Regarding the limitation that the induction coil be coreless, the purpose of providing the iron core in the inductor is to concentrate the effect of any magnetic field within the center of the induction coil (within the iron cores). However, as is well known by one of ordinary skill in the art, an inductor in its simplest form is a conductive wire formed in the shape of a loop or coil, and will create the magnetic field inside the coil without the presence of the core. Therefore, the inclusion of iron cores in the inductors disclosed by Fuscone is not necessary, as the inductor would still perform the necessary function of creating a magnetic field within the center of the induction coil with or without the iron core, albeit the magnetic field would not have been as concentrated as had the iron core been in place. If the claims are given their broadest reasonable interpretation, the limitation of "a plurality of coreless inductance coils with predetermined turns, provided with said frame and connected to said electronic scoring means", wherein "each of said coreless inductance coils is associated with a corresponding one of said scoring areas and defines a scoring signal zone" is met by the

invention disclosed by Fuscone, under the assertion that coreless induction coils is a matter of design choice and would have been obvious to one of ordinary skill in the art at the time of the invention. One would have been motivated to remove the core from the induction coil for any application that requires a small amount of inductance as in said dartboard to reduce the weight of the apparatus and lower manufacturing costs.

Regarding claim 2, said inductance coils are provided with a predetermined shape and are engaged with said scoring areas (Fig. 2).

Regarding claim 3, the cross-section of said coils matches, and is smaller than said scoring areas (Fig. 2).

Regarding claim 5, said frame with said coils is disposed in the back of the main body (Abstract, lines 4-7).

Regarding claim 8, the point of said dart is of a magnetic substance (Page 1, line 104).

Regarding claim 9, the slender shaft of said dart is of a magnetic substance (page 1, lines 104-106).

Regarding claim 10, said point and said slender shaft of said dart are integrated and magnetized simultaneously (page 1, lines 104-121).

Regarding claim 11, the main body of said dartboard is made of material used on a traditional dartboard (page 1, lines 41-45). The magnetization of said dart is used for changing the distribution of the magnetic field of said inductance coil (page 2, lines 20-21).

Regarding claims 4 and 6, Fuscone discloses that said frame provided with said coils is arranged behind that of the main body. Fuscone does not disclose arranging said frame in front of or within the main body. However, without a showing of criticality, it would have been obvious to one of ordinary skill in the art at the time of the invention to dispose said frame in different locations, whether in front of the body for ease of mounting, or to manufacture said board with the frame integrated to provide a more sturdy device.

Regarding claim 14, Fuscone discloses inductance coils with cores for sensing the changes in the magnetic field (Page 2, lines 20-21) upon the entering of said dart on to said dartboard, but is silent about said dart moving through one of said coils. It is well known in the art that there are a plurality of different ways and designs in which inductance can be formed and measured and a plurality of coil types and materials that may be used.

Regarding claim 15, the generation of an electric field when said dart moves through said inductance coils, coreless or with cores, is an inherent property of inductance.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fuscone in view of Clark (US 4,768,789).

Fuscone is silent on wiring the plurality of said coils corresponding to different scoring areas representing the same score together before being connected to said scoring means. However, it is a well-known concept in the art that the motherboard

required to run the electronic scoring only has a limited number of inputs. Clark discloses a dartboard system that supports this concept. In describing the motherboard used to control the electronic scoring, Clark states that connections must be connected to the same lines in order for the total number of scoring positions on the dartboard to be accounted for (Column 5, lines 26-29). It would have been obvious to one of ordinary skill in the art at the time of the invention to limit the number of inputs required, inputs having the same signal should be tied together into the same input line in order to conserve the number of inputs needed into the motherboard, therefore limiting the cost of electronic components required as well as creating a simpler wiring scheme into the motherboard.

NEW GROUND(S) OF REJECTION

Claims 1-6, 8-11, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuscone (GB 2,068,243A) in view of Gordon et al. (US 5,419,565).

Regarding claim 1, Fuscone discloses an electric dart game comprising a dart (Fig. 1), a dartboard provided with a frame of a plurality of scoring areas by a plurality of radial spiders and circumferential spiders which are arranged crossly (Fig. 2,7 and 9), with a main body for receiving said dart and attached to said frame, and an electronic scoring means for displaying signals collected from the scoring areas (Fig. 5). Said scoring system uses a plurality of inductance coils (Fig. 2 and page 1, lines 125-129 connected to the electronic scoring system (Fig. 5). Fuscone also discloses said dart is made of, thus provided with, a magnetic substance (page 1, lines 75-78, 103). Each of

said coils is associated with a corresponding scoring area and thus defines a scoring signal zone (Fig. 2). When said dart is thrown at said dartboard, a scoring signal is generated by said dart entering said signal zone and is transmitted to said scoring system (page 2, lines 20-24, 66-82).

Regarding the limitation that the induction coil be coreless, the purpose of providing the iron core in the inductor is to concentrate the effect of any magnetic field within the center of the induction coil (within the iron cores). However, as is well known by one of ordinary skill in the art, an inductor in its simplest form is a conductive wire formed in the shape of a loop or coil, and will create the magnetic field inside the coil without the presence of the core. Therefore, the inclusion of iron cores in the inductors disclosed by Fuscone is not necessary, as the inductor would still perform the function of creating a magnetic field within the center of the induction coil with or without the iron core, albeit the magnetic field would not have been as concentrated as had the iron core been in place. In an analogous system for measuring the point of impact of a missile, such as a sports projectile, on a target, Gordon discloses the use of electromagnetic coils (i.e. inductance coils), for use in the detection of the point of impact of said missile on said target (col. 4, line 60- col. 5, line 3). Gordon explicitly discloses that "The coils may be air wound or, to achieve a higher field, wound around a ferromagnetic core" in col. 5, lines 1-3, wherein the term air wound implies that the coils are coreless. Therefore, Gordon teaches that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the dart board disclosed by Fuscone to include inductance coils that are coreless, instead of inductance coils

containing iron cores, in an electronic sports target application analogous to that of a dart board.

Regarding claim 2, Fuscone discloses said inductance coils are provided with a predetermined shape and are engaged with said scoring areas (Fig. 2).

Regarding claim 3, Fuscone discloses the cross-section of said coils matches, and is smaller than said scoring areas (Fig. 2).

Regarding claim 5, Fuscone discloses said frame with said coils is disposed in the back of the main body (Abstract, lines 4-7).

Regarding claim 8, Fuscone discloses the point of said dart is of a magnetic substance (Page 1, line 104).

Regarding claim 9, Fuscone discloses the slender shaft of said dart is of a magnetic substance (page 1, lines 104-106).

Regarding claim 10, Fuscone discloses said point and said slender shaft of said dart are integrated and magnetized simultaneously (page 1, lines 104-121).

Regarding claim 11, Fuscone discloses the main body of said dartboard is made of material used on a traditional dartboard (page 1, lines 41-45). The magnetization of said dart is used for changing the distribution of the magnetic field of said inductance coil (page 2, lines 20-21).

Regarding claims 4 and 6, Fuscone discloses that said frame provided with said coils is arranged behind that of the main body. Fuscone does not disclose arranging said frame in front of or within the main body. However, without a showing of criticality, it would have been obvious to one of ordinary skill in the art at the time of the invention to

dispose said frame in different locations, whether in front of the body for ease of mounting, or to manufacture said board with the frame integrated to provide a more sturdy device.

Regarding claim 14, Fuscone discloses inductance coils with cores for sensing the changes in the magnetic field (Page 2, lines 20-21) upon the entering of said dart on to said dartboard, but is silent about said dart moving through one of said coils. It is well known in the art that there are a plurality of different ways and designs in which inductance can be formed and measured and a plurality of coil types and materials that may be used.

Regarding claim 15, Fuscone discloses the generation of an electric field when said dart moves through said inductance coils, coreless or with cores, is an inherent property of inductance.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fuscone (GB 2,086,243A) and Gordon et al. (US 5,419,565) as applied above, and further in view of Clark (US 4,768,789).

Fuscone/Gordon as applied above is arguably silent on wiring the plurality of said coils corresponding to different scoring areas representing the same score together before being connected to said scoring means. However, it is a well-known concept in the art that the motherboard required to run the electronic scoring only has a limited number of inputs. Clark discloses a dartboard system that supports this concept. In describing the motherboard used to control the electronic scoring, Clark states that

connections must be connected to the same lines in order for the total number of scoring positions on the dartboard to be accounted for (Column 5, lines 26-29). It would have been obvious to one of ordinary skill in the art at the time of the invention to limit the number of inputs required, inputs having the same signal should be tied together into the same input line in order to conserve the number of inputs needed into the motherboard, therefore limiting the cost of electronic components required as well as creating a simpler wiring scheme into the motherboard.

(10) Response to Argument

Appellant's assertion that the functioning of the invention disclosed by Fuscone would be clearly degraded by removing the iron cores from the inductance coils is not persuasive. Even if the strength of the magnetic field created by the inductance coil having an iron core was reduced as a result of removing the iron cores, Appellant admits that there are multiple well known ways to increase inductance, i.e. the strength of the magnetic field, on Page 8, lines 8-14 of Appellant's specification as originally filed, stating that:

"The intensity of electronic signal will depend on the elements, such as density of magnetic lines of force, turns of coil and rapidity for cutting magnetic lines of force, etc. In other words, the generated signal dimension is in direct proportion with these elements. Therefore, the manner for enhancing the magnetism of dart to increase the density of magnetic lines of force or increasing turns of coil or

increasing rapidity of dart can be applied if the control unit of the present dart game requires a rather large signal"

Thus, by Appellant's own admission, there are various art equivalent means of increasing the strength of the magnetic field of an inductance coil that do not involve the presence of an iron core, including increasing the number of turns of the inductance coil. It follows that it would have been obvious to one of ordinary skill in the art at the time of the invention to remove the iron core of the inductance coils disclosed by Fuscone and simply increase the number of turns in the coreless coil to create a magnetic field of equivalent strength to that of an inductance coil containing an iron core.

Appellant's arguments that the teachings of Gordon et al. are not a teaching of equivalents which is related or at all applicable to a dartboard, and further that the examiner has thus not found or relied upon an art-recognized teaching of equivalents (Appellant arguments, P. 11), are not found to be persuasive. While Gordon does not specifically disclose the target invention may be used as a dart board, Column 1, lines 45-50 recite that "It is an additional object to provide target apparatus suitable for individual, team and professional training and use including, if desired, apparatus that is easily converted to use in a variety of sports under a variety of environmental conditions", suggesting that the apparatus disclosed by Gordon is not limited in its uses.

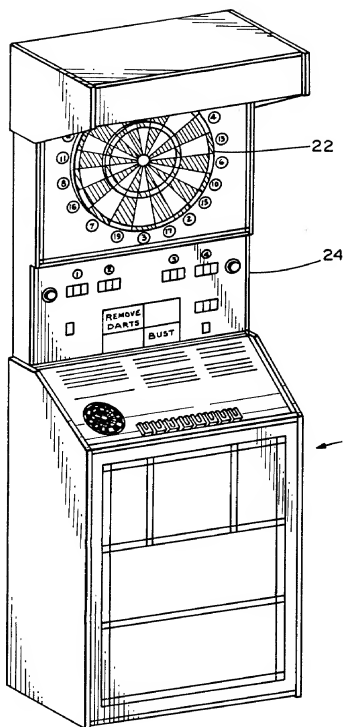
Further, the arguments that the invention disclosed by Gordon are not at all applicable to a dartboard which "1) are not configured to designed to have layers that

deflect; 2) are relatively thicker than 3/16 of an inch (assuming three layers as taught by Gordon et al.; and 3) are specifically made from materials that allow penetration by darts (e.g. bristle boards)" (Appellant arguments, P. 11), are not found to be persuasive. Gordon discloses that the target material comprises a "foam mat 20", and further that the mat can be "one to four inches thick" (col. 3, lines 47-53, emphasis added). As stated by Appellant, Gordon does teach that the three planes (that include the magnets 18, conductors 22 and wires 16) are preferably separated by no more than 1/16 of an inch, however this in no way indicates that the entire target apparatus itself may be no more than 3/16 of an inch thick. Gordon discloses "that the three planes are mounted between a half inch and one inch of the surface of the mat" (col. 4, lines 33-35). If the mat is between one and four inches thick, and the three planes are mounted between a half inch and one inch of the surface of the mat, the entire thickness of the target apparatus must be greater than 3/16 of an inch. As foam is readily capable of being penetrated by a dart, and Gordon explicitly states that the thickness of the mat alone may be up to four inches thick, Appellant's arguments are not found to be persuasive.

Finally, Appellant's argument that the invention disclosed by Clark teaches "that the areas representing different scores are wired together rather than areas representing the same score" (Appellant Arguments, P. 12-13), and that therefore the rejection of claim 7 as being unpatentable over Fuscone in view of Clark is improper, is not persuasive. Column 5, lines 20-31 of Clark recite that "The two single segments of each scoring radial are made common so that there are three multipliers for each of the twenty scoring radials. Counting the scoring value for the bull's-eye, the sixty-one

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scoring possibilities can easily be accommodated by sixteen outputs and four strobes which offer sixty-four combinations. In the actual connections, for example, the output contacts of each of the set of contacts associated with the double target segments for the **1,8,13** and **19** scoring radials are connected to output line **6**" (see Fig. 1, copied from Clark and provided below).



Clark, Fig. 1

As shown in Fig. 1 above, Clark does not specifically disclose the scoring values assigned to segments **1,8,13** and **19**. However, regardless of the score value assigned to the scoring segments, Clark provides a teaching of wiring together multiple scoring segments. The score value assigned to each segment is arbitrary, and could easily be altered to be whatever value the inventor determines most appropriate. Thus, the examiner maintains that Fuscone in view of Clark renders obvious the concept of wiring multiple scoring segments together, whatever the associated score value of the wired together segments may be. Changing the score value of the wired together segments does not provide a new, useful, or unexpected result over the invention disclosed by Clark and it would have been obvious to try changing the value of the scoring segments in order to yield the predictable result of limiting the number of inputs required, as inputs having the same signal should be tied together into the same input line in order to conserve the number of inputs needed into the motherboard, and therefore limiting the cost of electronic components required as well as creating a simpler wiring scheme into the motherboard.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identifiable by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

This examiner's answer contains a new ground of rejection set forth in section (9) above. Accordingly, appellant must within **TWO MONTHS** from the date of this answer exercise one of the following two options to avoid *sua sponte* **dismissal of the appeal** as to the claims subject to the new ground of rejection:

(1) **Reopen prosecution.** Request that prosecution be reopened before the primary examiner by filing a reply under 37 CFR 1.111 with or without amendment, affidavit or other evidence. Any amendment, affidavit or other evidence must be relevant to the new grounds of rejection. A request that complies with 37 CFR 41.39(b)(1) will be entered and considered. Any request that prosecution be reopened will be treated as a request to withdraw the appeal.

(2) **Maintain appeal.** Request that the appeal be maintained by filing a reply brief as set forth in 37 CFR 41.41. Such a reply brief must address each new ground of rejection as set forth in 37 CFR 41.37(c)(1)(vii) and should be in compliance with the other requirements of 37 CFR 41.37(c). If a reply brief filed pursuant to 37 CFR 41.39(b)(2) is accompanied by any amendment, affidavit or other evidence, it shall be treated as a request that prosecution be reopened before the primary examiner under 37 CFR 41.39(b)(1).

Extensions of time under 37 CFR 1.136(a) are not applicable to the TWO MONTH time period set forth above. See 37 CFR 1.136(b) for extensions of time to reply for patent applications and 37 CFR 1.550(c) for extensions of time to reply for ex parte reexamination proceedings.

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Respectfully submitted,

/Meagan Thomasson/
Examiner, Art Unit 3714

**A Technology Center Director or designee must personally approve the
new ground(s) of rejection set forth in section (9) above by signing below:**

/KAREN M. YOUNG/

Director, Technology Center 3700

Conferees:

/XUAN M. THAI/

Supervisory Patent Examiner, Art Unit 3714

/Gene Kim/

Supervisory Patent Examiner, Art Unit 3711